

ROBOTICS

RULES

- A. The name and county of each exhibitor should appear separately on the back of each board, poster or article and on the front cover of the notebooks so the owner of the exhibit may be identified if the entry tag is separated from the exhibit.
- B. Reports should be written using the scientific method whenever possible (Background, the Question or hypothesis, what you plan to do and what you did, Method used and observations, Results: what you learned. All reports should be computer generated and enclosed in a clear plastic cover. The reports should be attached securely to the display.
- C. Posters can be any size up to 28 inches x 22 inches when ready for display. Example: trifold poster boards are not 28 inches x 22 inches when fully open for display.
- D. Class F500037 and F500038 are part of the Robotics Showcase competition at the Nebraska State Fair. Exhibitors can take their robot to this competition in person.

Team Entries: To qualify for entry, team materials entered in robotics classes that are clearly the work of a team instead of an individual must have at least 50% of all team members enrolled in 4-H. Additionally, all enrolled 4-H members on the team should complete and attach an entry tag to the materials. A supplemental page documenting the individual contributions to the project should be included. The entry will be judged as a team, with all team members receiving the same ribbon placing.

Creating a video of your robot in action would be helpful for the judges but is not mandatory. Videos should be uploaded to a video streaming application and exhibitors should provide a hard copy QR code for viewing Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing.

- *H861001** **Robotics Poster** - (SF236) - Create a poster (28 inches x 22 inches) communicating a robotics theme such as “Robot or Not”, “Pseudocode”, “Real World Robots”, “Careers in Robots”, “Autonomous Robotics”, “Precision Agriculture”, or a robotic topic of interest to the 4-H’er.
- *H861002** **Robotics Notebook** – (SF237) – Explore a robotics topic in-depth and present your findings in a notebook. Documentation should include any designs, research, notes, pseudocode, data tables or other evidence of the 4-H’ers learning experience. The notebook should contain at least three pages. Topics could include a programming challenge, programming skill, calibration, sensor exploration, or any of the topics suggested in Class 1.
- *F500037** **Robotics Video** – (SF238) – This class should be displayed in a notebook. The notebook should include a video clip on a CD/DVD that demonstrates the robot performing the programmed function. Include your pseudo code and screenshots of the actual code with a written description of the icon/command functions. For county fair, videos can be uploaded to a video streaming application and exhibitors **MUST** provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions. At State Fair this is now a contest class.
- *H861004** **Robotics /Careers Interview** – (SF239) – Interview someone who is working in the field of robotics and research the career in robotics. Interviews can either be written or in a multimedia format such as a short video uploaded to a cloud sharing service. Include a QR code with your project to allow for judging access. Videos can be uploaded to a video streaming application and exhibitors **MUST** provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing. Written interviews should be in a notebook. Written reports should be 3 to 5 pages, double spaced, 12-point font, and 1 inch margins. Multimedia reports should be between 3 to 5 minutes in length.
- *H861005** **Robotics Sensor Notebook** – (SF241) - Write pseudo code which includes at least three sensor activities. Include the code written and explain the code function. Codes can be submitted as a multimedia format uploaded to a cloud sharing service. Include a QR code with your project to allow judging access. Multimedia presentations should be 3 to 5 minutes in length. Videos can also be uploaded to a video streaming application and exhibitors **MUST** provide a hard copy or QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.
- *F500038** **Build a Robot (may use kit)** – Include a robot and notebook including the pseudocodes for at least one program you have written for the robot, the robots purpose, and any challenges or changes you would make in the robot design or programming. At State Fair this is an in person contest class.

***H861007 Kit Labeled Robot (cannot be free programmed) and Notebook** – (SF243) - This class is intended for explorations of robotic components such as arms or vehicles OR educational kits marketed as robots that do not have the ability to be programmed to “sense, plan and act.” The exhibit should include a notebook with the robot the youth has constructed. Included in the notebook should be 1) a description of what the robot does, 2) pictures of programs the robot can perform, 3) why they chose to build this particular form, and 4) how they problem solved any issues they might have had during building and programming. A picture story of assembly is recommended.

***H861008 3D Printed Robotics Parts** – (SF244) - This class is intended for youth to create parts through 3D printing, that help create their own robot or aid the robot in completing a coded function. Project should include notebook describing the process used to create the project, describe the success of your designed piece (did it work), intended use of the product and the modifications made to the item.

Resources:

- Junk Drawer Robotics 1 – Discover the design and functions of robotic arms; Build a robotic arm that moves.
- Junk Drawer Robotics 2 – Explore robot movement, power transfer, and locomotion; Design and build machines that roll, slide, draw, or move underwater
- Junk Drawer Robotics 3 – Make the connection between the mechanical and electronic elements of robots; Explore sensors, write programs, build circuits, and design your own robot.
- Robotics Platforms – Use commercial robotics kits to explore the world of robotics; Learn to program your robot using sensors, loops, and conditional statements.
- Virtual Robotics – Learn how robots are designed and developed; Program your own virtual robots and test it in a variety of environments.